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ABSTRACT

Sixteen (16) male and sixteen (16) female fourth graders from disadvantaged backgrounds and from advantaged backgrounds were given the Wechsler Intelligence Scale for Children (WISC) and the Matching Familiar Figures Test (MFFT), followed by a paired-associates task and a discrimination learning task. Results showed socioeconomic status differences in general intellectual functioning but not in impulsivity-reflectivity learning. There was some suggestion of a relationship between impulsivity and discrimination learning. (Author/TA)

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SOCIOECONOMIC BACKGROUND AND COGNITIVE FUNCTIONING IN FOURTH GRADE CHILDREN

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Abstract

Measures of intellectual functioning, impulsivity-reflectivity, paired-associate and dissemination learning were given to 16 males and 16 female fourth graders from disadvantaged backgrounds and from advantaged backgrounds. Socioeconomic status differences were found in intellectual functioning but not in impulsivity-reflectivity learning. There was some suggestion of a relationship between impulsivity and discrimination learning. Hypotheses regarding the latter finding were discussed.

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The response disposition of impulsivity-reflectivity as a cognitive style was defined (Kagan, Moss, Day, Albert, & Phillips, 1964) as the tendency to reflect over alternative hypothesized solutions to a problem. Research on reflectivity-impulsivity in young children has indicated that it can be measured reliably (Kagan, 1966), and that reflectivity increases ontogenetically. It has been found to correlate significantly with success on some types of tasks such as test of inductive reasoning (Kagan, Pearson, & Welch, 1966) and reading achievement (Kagan, 1965), but not on others such as paired-associates learning task and a test of motoric inhibition (Mumbauer & Miller, 1970).

It has been speculated (Mumbauer & Miller, 1970) that one skill important to success on the MFFT is ability to visually analyze the stimulus. If such were the case, success on tasks requiring such a skill would be more closely related to

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performance on the MFFT than success on tasks not requiring this skill. This study was designed in part to test this notion. A discrimination learning task DRT was designed which appeared to require stimulus analysis for solution. This task and a paired-associates learning task (PAL) which appeared to demand little stimulus analysis were given to Ss with the expectation that MFF performance would correlate with success on the former but not the latter. A measure of general intellectual functioning was also given and expected to relate to success on both learning tasks. Socioeconomic differences in subject groups and their relationship to manifested impulsivity-reflectivity and learning task efficiency were also of interest.

Method

16 male and 16 female, fourth grade children were selected from Nashville area public schools serving families of lower socioeconomic status along with an equal number of Ss of each sex from schools serving middle and upper middle class families. Occupations of the fathers of the advantaged sample fell into group I, II and III on the Hollingshead (1965) scale, while ratings of VI and VII were appropriate for occupations of the fathers in the disadvantaged sample. Subjects ranged in age from 9 years, 0 months to 10 years, 6 months. The mean age of both groups was 9 years, 9 months.

Procedure

All Ss were given the Wechsler Intelligence Scale for Children (WISC) within six weeks prior to the remainder of the test battery. All Ss were tested individually by two females Es who administered the MFFT, paired-associates learning task and the discrimination learning task to an equal number of male and female Ss from

each socioeconomic class. At the second testing session Ss were first given the Matching Familiar Figures Test (MFFT) followed by a paired-associates task and a discrimination learning task. The order of the latter two tasks was counterbalanced across sex and socioeconomic groups.

The MFFT was administered according to the procedure specified by Mumbauer & Miller (1970). On each trial of the MFFT, the child was presented a standard stimulus along with six comparison stimuli, five of which varied slightly in detail from the standard. He was told to point to the one which was the some as the standard. If his first response was incorrect, he was so informed and allowed to continue attempting solution until he was correct. Two practice and 12 test trials were given. The mean reaction time to first response and the number of errors was recorded for each S.

The difficult form of a paired-associate learning task (PALT) was administered according to the procedure specified by Mumbauer & Miller (1970). It was constituted by a set of 10 pairs of pictures of common objects chosen for their low associative strength. The stimulus picture was flashed on the screen for three seconds, followed by and occurring simultoneously with the response stimulus for three seconds. The intratrial interval was also three seconds. A criterion of two errorless sets was employed. Number errors to criterion were recorded for each S.

The DLT was composed of a series of slides presented by a carousel projector. On each slide, there were two stimuli. Each stimulus was a stick figure composed of one cue from each of the two dimensions of line to curve and orientation. Within the line to curve dimension, a three part stick figure had either three or two curved components; the straight component was always the same component. Within the

orinetation dimension, the stick figure was either oriented vertically or 90 degrees in the direction of the center of the slide (Gibson, 1965). For each S one cue within one dimension was correct and its position was varied according to a Gellermon series (1933). The cues of the irrelevant dimension varied randomly (Gellerman, 1933). Each S was asked to point to the picture that won with a stick pointer. During the first or training problem, Ss were randomly assigned to a problem within one of the two dimensions. During the transfer problem, a cue within the previously irrelevant dimension was correct. Trials to criterion and response latency were recorded in training and transfer.

Results

A 2 (Socioeconomic Class) X 2 (Sex of S) analysis of variance was run on all six dependent measures including WISC IQ scores, MFF latency and errors, PAL errors to criterion and DLT trials to criterion and latency in training and transfer. The mean IQ of middle class Ss (113.28) was significantly higher ($p < .01$) than the IQ of the lower class Ss (98.32). No other main effects nor any of the interactions reached significance at the .05 level.

Pearson product moment correlations were run among all dependent variables from all Ss. The correlation between MFFT latency and error of -.37 was significant at the .05 level. Also significant at the .05 level was the correlation between MFFT latency and DLT trials to criterion in transfer (-.36).

Discussion

As has been found many times before, middle class Ss performed better on the measure of general intellectual functioning than did lower class Ss. Few other

expectations were supported by the data.

Socioeconomic class differences were not found on either of the learning measures. Nor were differences found on the indicants of reflectivity.

The correlation between MFFT latency and error was like that found in other previous studies (Mumbauer & Miller, 1970). The lack of correlation found between IQ and MFFT measures was similar to the results found by Kagan (1966) with elementary school children, but different from the results from preschool Ss (Mumbauer & Miller, 1970).

The hypothesis that the IQ measure would correlate significantly with PAL performance and MFFT latency and error with DLT performances were generally not supported. Ss with longer MFFT latency did tend to have fewer DLT transfer trials to criterion. This finding provided some support for the hypothesis that cognitive style as measured by the MFFT involves stimulus analysis and is therefore more predictive of success on tasks requiring such a skill than on those that do not. While MFFT latency might have been expected to correlate with DLT latency performance as well, it did not. The limited spread among Ss on the DLT training problem may have limited the correlation possible. Further conformation of the hypothesis would have come from a significant relationship between MFFT error and DLT performance. Again the coefficients of the relationships did not reach statistical significance.

The fact that there was a socioeconomic class difference on the IQ measure but none of the learning measures suggest that perhaps the learning tasks were too easy to discriminate among Ss of differing competence.

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